

ment at the base of the third joint. When confined in a small glass tube, these Spiders often move their palpi backwards and forwards with a slight rotatory motion in such a manner that the horny plate crosses the bands on the falces; but hitherto I have been unable, even with the aid of a microphone, to detect sounds in connexion with these movements.

The bands appear to be a modification of grooves which are to be found on the falces, and which are similar to those already mentioned on the palpi, and are also present, without any specialized form, on the falces of *Linyphia clathrata*, Lund, whose habits resemble those of the *L. tenebricola*, Wider. They are sufficient to give an appearance of slight serration; but up to the present I have been unable to find any opposing surface which could be used for stridulation in *Linyphia clathrata*.

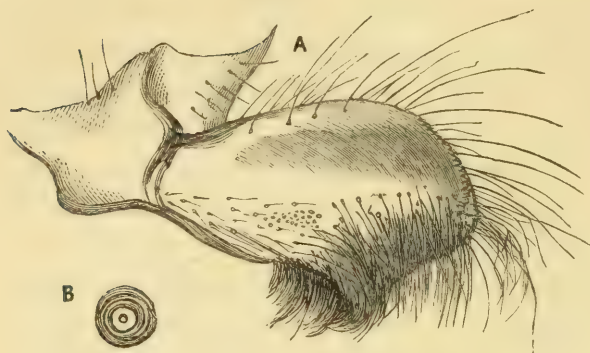
The absence of specialized stridulating-organs in most Araneæ does not, however, imply that they are mute. It is a common practice with many to rub the falces against the maxillæ; and were the serrated edge of these latter found in another part of the body, similarly opposed to a hard toothed chitinous surface, it is most likely they would be pronounced stridulating-organs.

On certain Glands in the Maxillæ of *Tegenaria domestica*, Blackwall. By F. MAULE CAMPBELL, F.L.S., F.Z.S., F.R.M.S.

[Read June 17, 1880.]

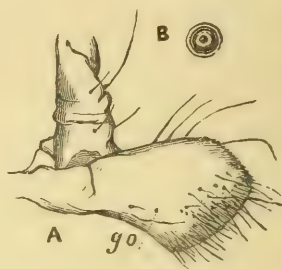
DR. A. WASSMANN, in "Beiträge zur Anatomie der Spinnen" (Abhandl. aus dem Geb. der naturwiss. Hamburg, Erster Band, 1846), and M. Felix Plateau, in his "Recherches sur la Structure de l'appareil digestif, et sur les Phénomènes de la Digestion chez les Aranéides dipneumones" (Bull. Acad. Roy. de Belgique, sér. 2, t. xlv. 1877), describe a gland which is seated in the labrum; but they, like all other writers to whom I have referred, make no mention of those which I am about to describe. In the *Tegenaria domestica* the apertures are on the inner side of the median line of the upper face of each maxilla, where they commence to incline towards the mouth, as seen in woodcuts figs. 1 and 2, A. The external form consists of a ring (figs. 1 and 2, B), .005 millim. in diameter (average outside measurement) in adults, enclosing a raised disk, in the centre of which is the opening leading to a shallow cavity, from which runs the

Fig. 1.



A. Upperside of left maxilla of *Tegenaria domestica*, Blackw., immature ♀, $\times 40$. B. One of the gland-openings, $\times 770$.

Fig. 2.



A. Upperside of maxilla of *Tegenaria domestica* from the first exuvium: *go*, gland-opening, $\times 66$. B, single gland-opening on above, $\times 770$.

duct, gradually increasing in size, until it terminates in an elongated bulbous point (fig. 3, A). I have been unable to trace any further continuation of the organ; but in a *Lycosa campestris*, Blackw., where the apertures are of similar form and position, I have found fine filaments, as shown in fig. 3, C, while in some species the ducts are ramose.

Fig. 3.



A. Gland from maxilla of *Tegenaria domestica* attached to inner skin. That marked with an asterisk (*) has its terminal point broken. $\times 250$.

B. Chitined-gland attached to maxilla of *Ciniflo ferox*, Blackw., and, as here shown, is foreshortened. $\times 250$.

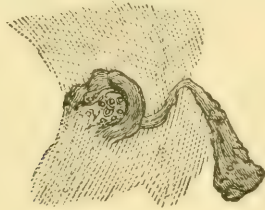
C. Chitined-gland from maxilla of *Lycosa campestris*. $\times 250$.

The surface on which the glands discharge their contents is crossed by many interlacing open channels formed by folds in the integument (see fig. 5, E), and which run backwards and down-

wards towards the mouth. I am inclined to think that these glands have a function equivalent to salivary; and in many species of the Linyphiidæ, Theridiidæ, Salticidæ, and Epeiridæ there are similar organs, but distributed at the side of the maxillæ close to the mouth in a cup-like cavity, as seen in the accompanying fig. 4, from an *Epeira similis*, Blackw.

A peculiarity of the ducts is that in many species they become chitinous (fig. 4); and this is common in adults, so that it cannot be considered the result of a condition preceding a moult.

Fig. 4.



Chitinous gland-opening on maxilla of *Epeira similis* (♂), as seen from outside of maxilla, with one chitined-gland attached, × 200.

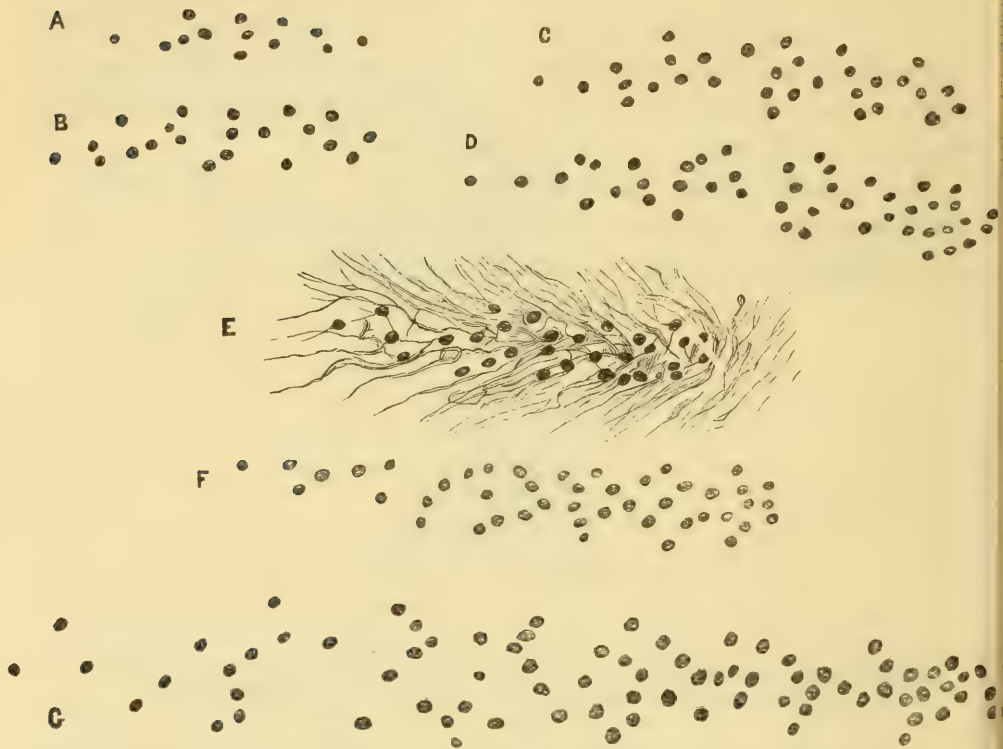
In the *Tegenaria domestica*, Blackw., and also in other species, the number of these glands, together with the integumental channels, increases with age. I found only one aperture on each maxilla of the first exuvium of ten of this species and two on the second. A young one which last year I kept in confinement gave the following results, viz. :—

Date of exuvium, 1879.		Number of gland- openings.
15th May	Woodcut fig. 5, A	13
9th June	„ B	21
1st August	„ C	31
21st September ...	„ D	46

In the diagrammatic woodcut (fig. 5, C, D, E, and F) the relative positions on each exuvium are indicated; and it will be seen that the number on each maxilla is the same, though the distribution is not. Unfortunately this Spider was allowed to escape in December, so that I cannot give more figures; but fig. 5, G, represents eighty gland-openings on an adult *Tegenaria domestica* (female), while in others I have found as few as sixty.

These remarks are the result of an investigation which was

Fig. 5.



Diagrams representing the gland-openings on the maxilla of *Tegenaria domestica* at different stages; about $\times 200$.

A. As in the exuvium of right maxilla, 15th May. B. Ditto, 9th June. C. Ditto, 1st August. D. Ditto, 21st September. E. As in the exuvium of left maxilla, 1st August: the integumentary channels are here shown. F. As in exuvium of 21st September. G. Gland-openings in an adult female of *T. domestica*.

necessarily prolonged, owing to the continual rupture of the duct and terminal portion of the glands on opening the maxillæ. I first observed the external organs with a $\frac{2}{3}$ objective, and think that the reason why they have hitherto escaped notice is that under such a low power they appear like simple rings, and resemble the integumental structure at the base of some minute setæ distributed about the same surface. Even with a $\frac{1}{5}$ and $\frac{1}{10}$ this definition might at first be confirmed, and the form of the raised disk attributed to the approximate focusing of different points in an attached open duct. By using the bleaching process described by Dr. Braxton Hicks (Linn. Trans. 1st ser. vol. xxii. p. 396) and mounting in balsam, the form of the external organ, however, is clearly seen with a $\frac{1}{5}$ objective.